

REMARKS/ARGUMENTS

Favorable reconsideration and allowance of the present application are respectfully requested in view of the following remarks. Claims 22-46 remain pending. Claims 22, 40, 41 and 46 are independent. Claims 23 and 24 are amended.

A. ALLOWABLE SUBJECT MATTER

Applicants appreciate that claims 37 and 38 are indicated to define allowable subject matter. *Office Action, p.15, item 8.*

B. OBJECTION TO THE CLAIMS

Claims 23 and 24 stand objected to for informalities. *Office Action, p.2, item 3.* These claims are amended to address the issues raised. The scope of the claims remain unchanged by the amendments. Applicants respectfully request that the objection to the claims be withdrawn.

C. §103 REJECTION – CECILE, JOHANSSON

Claims 22-36, 39-44 and 46 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Cecile (EP 1220557A1) in view of Johansson et al. (U.S. Publication No. 2004/0219912 A1, *hereinafter Johansson*). Applicants respectfully traverse.

When administering shared resources, somewhat contradictory objectives – efficiency and fairness – are considered. Fairness can be achieved by strictly dividing the available resources such that each operator gets its own resources and cannot utilize any other resources. However, efficiency would not be maximized in a global sense. On the other hand, if the resources are managed together without any concern about which operator uses which resource, one may end up in a congestion situation where one operator is denied resources despite the fact that the operator has not yet fully utilized its allocated portion. *Original disclosure, p.6, ll.5-20.*

In an aspect of the disclosed subject matter, control is provided over how the available resources are used by different operators, particularly at or close to congestion situations. Generally, to maximize the overall efficiency, all connections are accepted during non-congested situations, which means that an operator can exceed the agreed proportion when the resources are abundant. However, at or close to congestion, new connections are accepted if the operator's agreed upon proportion is not exceeded. *Original disclosure, p.6, ll.22-30.*

Fig. 2 of the disclosure schematically illustrates shared resources as a rectangle in which the area of the rectangle corresponds to the total resources “C” shared by three operators who are allocated portions C_{p1} , C_{p2} and C_{p3} . Also, β represents a congestion threshold, and Δ represents the amount of free resources, i.e., unused portion of the shared resources. *Original disclosure, p.7, ll.8-30.*

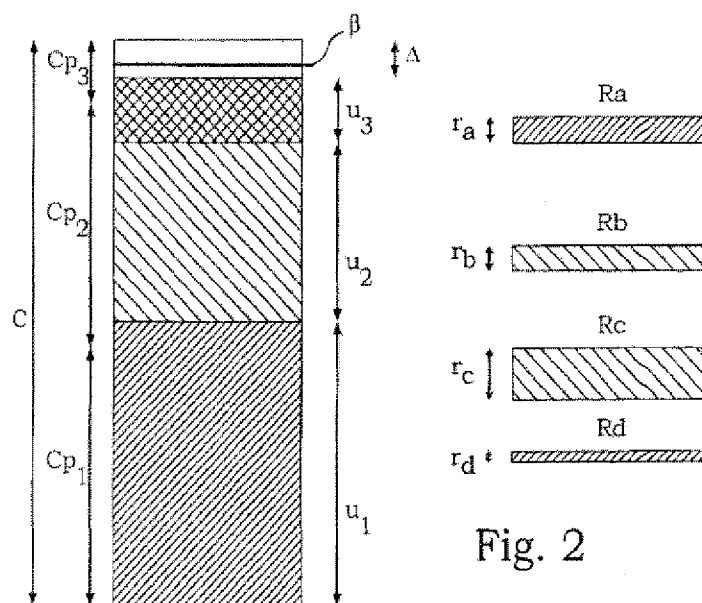


Fig. 2

Fig. 3 of the disclosure is a flow diagram of an example inventive method for managing resources that are shared by at least two operators.

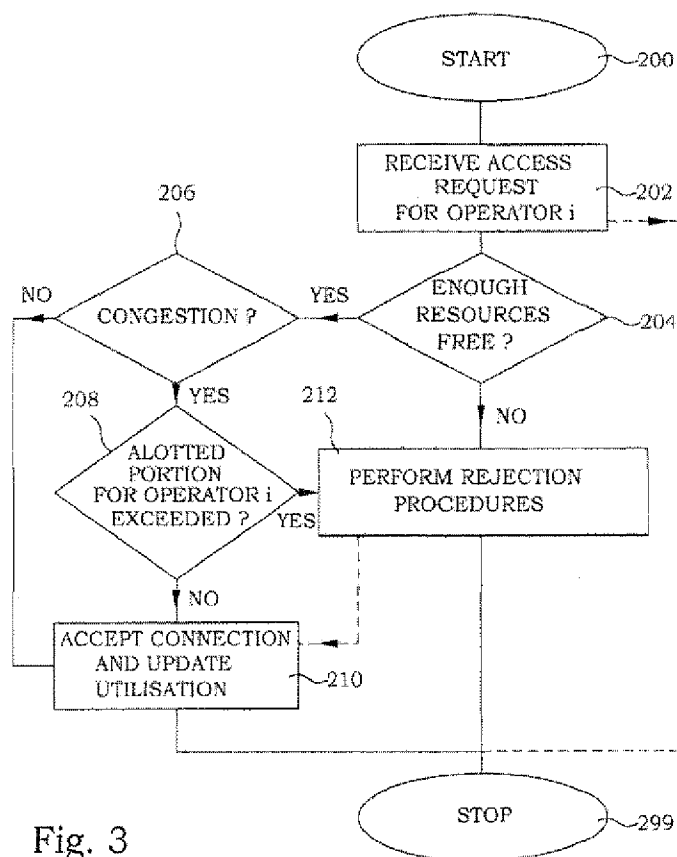


Fig. 3

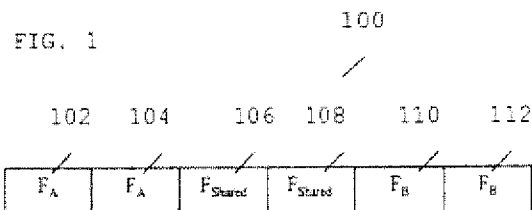
Upon reception of an access request for a first operator (step 202), the system executes a first determination whether there are sufficient amount of free resources available in the communication system (step 204). The system then determines whether or not the system will be congested (step 206). In one aspect, the system determines whether or not the system will be congested by executing a second determination of whether a total amount of the resources shared by the at least two operators in use in the communication system exceeds a first threshold (step 206). If the system is congested, the system determines whether the first operator has fully used its allocated portion of the shared resources (step 208). To make this determination, in one aspect, the system executes a third determination whether a total amount of resources shared by at least two operators in use for the first operator exceeds a second threshold. The system can decide to accept the request or not based on the results of the first, second and third determinations. *Original disclosure, p.9, l.13 – p.10, l.18*. These features are reflected in the features recited in claim 22.

The combination of Cecile and Johansson does not teach or suggest all claimed features. In the Office Action, the Examiner relies upon [0061]-[0062] and [0069] of Cecile to allegedly teach executing the third determination. *Office Action, p.3*. On the contrary, Cecile does not teach or suggest this feature.

Cecile is directed to a method for dynamic inter-Operator resource sharing. *Cecile [0001]*. Cecile notes that there are several spectrum utilization techniques ranging from extremes of fixed carrier assignment (FCA) and

dynamic carrier assignment (DCA). In FCA, each operator is strictly allocated a fixed amount of spectrum. In DCA, all frequencies are pooled and are made available to all operators. Cecile notes that there are disadvantages with both utilization techniques. *Cecile [0002]-[0010]*.

To address these issues, Cecile proposes a hybrid carrier assignment (HCA) mechanism in which a portion of the spectrum is allocated to an operator and another portion is available for shared use among the operators. Cecile illustrates this in Fig. 1 in a block diagram 100 of a spectrum allocation arrangement with frequency sharing of frequencies 102-112. Operator A has “proprietary frequencies” F_A 102, 104 and Operator B has its own proprietary frequencies F_B 110, 112. Two frequencies F_{Shared} 106, 108 are the only shared frequencies. *Cecile, [0032 – 0034]*.



In Cecile, the proprietary resources behave as FCA resources. But more importantly, all shared resources behave as DCA resources. Regarding the circumstance illustrated in Fig. 1, Cecile states “In this case, each network can potentially use up to four frequencies.” *Cecile [0034]*. For example, Operator A can be allocated both shared frequencies in one instance, and Operator B can be allocated both shared frequencies in another instance. That is to say, there is no concept of allocating portions of the shared resources among operators.

Indeed, there is no such need since each operator is allocated a dedicated portion of the resources.

Paragraphs [0061]-[0062] and [0069] of Cecile relied upon by the Examiner describes an architecture for dynamic inter-Operator spectrum sharing and a method for signaling exchange between a local controller 610, 612, 614 of an operator and a common controller (CC) 606 as illustrated in Figs. 6 and 7 of Cecile. Paragraph [0061] lists the information that can be exchanged between the common controller and different operators. For example, CC 606 can broadcast that a given frequency is available for sharing. As another example, an operator 620, 622, 624 can request to use a frequency available for sharing. Paragraph [0062] merely indicates that when a shared spectrum is no longer available, an "ACCESS FORBIDDEN" message can be sent. In paragraph [0069], Cecile merely indicates that upon analyzing an access request for the shared spectrum from a local controller of an operator, the common controller will send an ACCESS INCREASE message to the local controller if sufficient bandwidth can be offered to the operator on the shared spectrum.

Contrary to the Examiner's allegation, nothing in these paragraphs, nor anywhere else in Cecile for that matter, indicate determining whether or not the total amount of shared resources that is in use for an operator exceeds threshold of any type.

As such, Cecile cannot teach or suggest the feature of "executing a third determination whether a total amount of said resources shared by the at least

two operators in use for the first operator exceeds a second threshold” as recited in independent claim 22. The Examiner correctly does not rely upon Johansson to correct for this deficiency of Cecile. This is sufficient to distinguish claim 22 from the combination of Cecile and Johansson.

For similar reasons, independent claims 40, 41 and 46 are also distinguishable over Cecile and Johansson. By virtue of their dependencies from claims 22 and 41 as well as on their own merits, claims 23-36, 39, 42-43 and 44 are distinguishable over Cecile and Johansson.

Applicants respectfully request that the rejections of claims based on Cecile and Johansson be withdrawn.

D. §103 REJECTION – CECILE, JOHANSSON, PELTOLA

Claim 45 stands rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Cecile in view of Johansson and Peltola et al. (U.S. Patent No. 7,218,937 B2, *hereinafter Peltola*). *Office Action, p.15*. Applicants respectfully traverse.

Claim 45 depends from claim 22 and Johansson and Peltola, individually or in combination, do not correct the deficiencies of Cecile. Thus, claim 22 is also distinguishable over Cecile, Johansson and Peltola. By virtue of its dependency from claim 22, claim 45 is also distinguishable over Cecile, Johansson and Peltola.

Claim 45 is distinguishable on its own merits as well. The Examiner points to *c.3, l.20 – c.4, l.52* and *Figs. 1, 5 and 6* of Peltola to allege that the feature of the second threshold being related to an agreed proportion of resources shared by the at least two operators for use by the first operator. In Peltola, there is no concept of having a common pool of resources that is shared by multiple operators. Rather, Peltola is clear that multiple operators each have dedicated resources such as dedicated hardware and spectrum. *Peltola, c.3, ll.40-48.*

In Peltola, if an operator has spare capacity, for example operator B, the operator can offer the available capacity to another operator, for example operator A, at a certain price. Instead of disappointing its customers, operator A might decide to purchase capacity from operator B. *Peltola, c.3, ll.49-67.*

As seen in Fig. 5, the operator with spare capacity allocates its own channels and/or radio resources for potential sale to other operators. The allocation of these resources is made purely by the operator without any input from other operators. Thus, there can be no agreed proportion threshold of any type. Clearly, Peltola does not teach or suggest the features of claim 45.

Applicants respectfully request that the rejections of claim 45 based on Cecile, Johansson and Peltola be withdrawn.

E. CONCLUSION

All objections and rejections raised in the Office Action having been addressed, it is respectfully submitted that the present application is in condition for allowance. Should there be any outstanding matters that need to be resolved, the Examiner is respectfully requested to contact Hyung Sohn (Reg. No. 44,346), to conduct an interview in an effort to expedite prosecution in connection with the present application.

The Commissioner is authorized to charge the undersigned's deposit account #14-1140 in whatever amount is necessary for entry of these papers and the continued pendency of the captioned application.

Respectfully submitted,

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By: _____



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